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THE ELEMENTARY SCHOOL TEACHER

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CORN¹

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INTRODUCTION (FOR TEACHERS)

The following treatment of the subject of corn is intended as a geography topic for fifth or sixth grade.

Preceding this in the earlier grades a number of lessons have probably been given on the corn topic, both in geography and science, while history and literature have dealt with it also in important ways. These preliminary lessons may be presupposed somewhat as follows.

In primary classes the children have planted corn in window boxes and have watched its growth. Sprouting it between wet blotting papers may have been tried also. In the spring and summer gardens on the campus, the children have planted, cultivated, and harvested the corn. In the fall they may have studied the ripening corn in tassel. This is an excellent lesson on the corn plant as a type of grasses and grains, with which it is compared by bringing specimens of wheat, oats, rye, and the grasses together.

In the third or fourth grade the corn has been studied locally as a geography topic in the prairie region surrounding us in Illinois. Its method of cultivation, its uses on the farm, and its shipment to the Chicago market are worked out.

The pioneer history stories of the prairie states make frequent statements regarding the uses of corn among the Indians and early

¹ This is the first of three papers which constitute the report of the Committee of Seven of the Superintendents and Principals' Association of Northern Illinois.

settlers. In literature and reading, the "Hiawatha" has probably brought to children the beautiful story of Mondamin as told by Longfellow. The children have also seen something of the corn shows and corn testing which are now somewhat common in our schools.

In the present treatment of this topic the children are supposed to have reached the point where they can take up this study from a geographical point of view, and work out the problem of corn production on a large scale in the corn belt, and expand this into a comprehensive survey of its importance for the United States and America.

A brief extension of the idea to other corn- and grain-producing countries may close the treatment with a world survey, though the completion of this phase of the topic may be left to later grades.

The historical thread upon which the treatment is developed is designed to give a concrete and progressive expansion of the thought in close relation to historic facts. This rapid development of the thought may take strong hold upon the minds of children. It interprets the world in a constantly enlarging horizon of thought, bringing in something new and instructive at every step.

OUTLINE ON CORN

1. Corn in the native wild state.
2. Cultivation of corn in Indian villages.
3. The pioneer settlers and their use of corn.
4. The prairie and other farmers of the corn belt.
5. The inventions and machines connected with corn production. Manufacturing plants for agricultural machinery.
6. The cultivation of corn at the agricultural department of the State University. Experiments by scientific experts.
7. Extension of corn cultivation north and south of the corn belt.
8. Other corn-producing countries in America, Europe, Asia, Africa, etc.
9. Corn turned to bad uses—whiskey.
10. Corn compared with other important cereals—wheat and rice.

SUGGESTIONS AS TO METHOD

1. Although geographical in its main purpose this topic is, to a large extent, historical and may be illustrated with pictures from the various periods of history included.

2. Make a collection of the regular products and by-products of corn, as flour, bran, starch, glucose, sugar, oil, breakfast foods, etc. Such bottled collections can be had from some of the manufacturing companies, as The Corn Products Company of Chicago, The American Starch Company, Oswego, N.Y.
3. The later geographies contain maps showing the corn belt in the United States and its extension north and south. Let children also make maps illustrating the corn and grain belts.
4. At the Field Columbian Museum of Chicago is found a large collection of corn and its by-products, well worth visiting with a class.
5. The practical bulletins in regard to corn cultivation and soil treatment, silos, etc., can be had from the State Agricultural Experiment stations, especially for Illinois, Iowa, and other states of the corn belt, and from the government at Washington.
6. A comparison of the corn belt with that for wheat and small grains, and for cotton and other staple products is of much value. Maps showing these areas are in the geographies or can be worked out on outline maps.
7. This topic is one of great interest at the present time in connection with agriculture in the schools and Farmers' Institutes.
8. The supplementary references in geographical readers and in history and literature, as in "Hiawatha," the "Corn Song," etc., are well worth attention.
9. Excursions to corn and grain fields and to experiment stations, and experiments with planting, cultivating, selection, and testing of corn may be carried out to much advantage.
10. A closer inspection of farm machinery at the implement stores and even experience in handling these machines is desirable.
11. Closely related science topics bearing on soils and fertilizers, and experiments on the growth of plants with whatever constructive problems belong to them should be associated with these corn studies.

CORN

1. Corn in its various uses has become one of the great staple products which figure in the large concerns of the world market.

The corn belt in the United States is peculiarly interested in the successful cultivation of corn. In a larger sense corn is produced in nearly all parts of the United States, and is hardly surpassed in importance by any single product.

Originally the corn plant was a wild specimen of the grasses growing in the warm subtropical parts of America, as Mexico. We may suppose that even then it was of some value to the birds and animals feeding on grain, as is the wild rice, the weed seeds, and the nuts and fruits growing wild upon the trees and bushes. The Indians probably found it good relishable food where they could pluck it in the milk or later in the ripened grain.

In the wild state the ears were smaller, as the ground was not cultivated and there was no selection of seed. As in the case of other grains and fruits, it has taken centuries and perhaps thousands of years to develop corn from its primitive wild state, where the stalks were short and the ears small, to the large fruitful stalks and ears of our best varieties of corn, today.

2. The white men, when they first came to the regions of the eastern and southern states, found the Indian women cultivating corn in small fields about their villages. By this time the corn plant had spread northward from the semitropical countries and under cultivation had become a strong, hardy plant producing good large ears. In New England and in Virginia, the early settlers found it a strong necessity to procure corn from the Indians, who stored it away in baskets for the winter supply of food. The first explorers of the Illinois River valley, under LaSalle, found stores of corn in the Indian villages.

Along the valleys of central New York, among the Iroquois, were many villages and quite extensive fields of Indian corn, which gave a settled aspect to the country and brought about the beginnings of social and political life and a stronger organization of society.

The Indians had interesting legends of the corn plant, like that which Longfellow has told in *Hiawatha*, which expressed their notion of the importance of corn to them as a people. They had not only learned how to plant and cultivate corn, but also interesting modes of cooking and using it in palatable dishes, which were learned by the early settlers and have remained common to this day, as cornmeal mush, hominy, hoe cakes or pone cakes.

In central New York, in the Maumee Valley of Ohio, and in other Indian settlements, the power of the hostile Indians was finally broken by destroying their villages and laying waste their corn fields.

3. The pioneer settlers in Virginia and New England suffered much from hunger and starvation till they had learned from the natives how to plant and raise a corn crop. In Virginia the starving time well-nigh destroyed the colony before they divided up the land into small farms and allowed each man or family to clear the ground for the planting of corn, beans, and pumpkins. But from that time on there was abundance of food.

In pushing westward upon hunting and exploring trips the pioneers carried with them for food a store of parched corn and sometimes they sent forward in the early spring a few men to plant fields of corn for use by the later settlers when they arrived during the summer and fall. This was the case with Robertson, who settled at Nashville.

John Fiske says that on account of corn being more easily raised, harvested, and changed into food than wheat and other grains, it had a great influence upon the rapid settlement and the westward movement of population during pioneer times.

Not only in the hard labors of the pioneers did corn figure, but in their social festivities. The corn-husking frolics were among the chief of social events and the song of the huskers celebrates their festive sports. On Thanks-

giving day even till now we gather in the yellow or speckled corn and the tall yellow fodder to decorate our houses and schoolrooms. Popcorn has likewise long held a favorite place at family gatherings and in the fun and frolic of the children.

Throughout the eastern states and far into the Ohio Valley it was necessary to cut down the forests and clear away the brush and logs before a corn crop could be raised. This rendered the early life of the pioneers hard and laborious. Even upon the prairies the tough sod, which had never been disturbed, had to be broken by the heavy breaking plow by one or more yokes of oxen and it required one season to rot the heavy matting of grass roots before the full crops could be secured. But the ground once broken or cleared was rich in vegetable mold and produced surprising crops of corn, melons, vegetables, and other grains, fruits, etc.

4. But the uses of corn in early pioneer days were only the beginning (and a very small beginning) of that vast and profitable farm business of corn-raising which is now carried on in what is known as the *corn belt* of the United States. The few hundreds and thousands of bushels raised in pioneer days have grown into the millions, hundreds of millions, and even billions of our present enormous production. Instead of a few little patches in the river bottoms and around the Indian villages, instead of a number of scattered clearings for corn in the boundless forests of the Ohio Valley, we now find corn fields stretching away field after field over millions of acres.

As the early immigrants moved acrosss the Alleghenies into the Ohio Valley and opened up new farms they soon found that they were raising more corn, grain, and stock than they could use. These new-found lands were so rich that they gave an abundant surplus. The great question in those early days of the nineteenth century was how to find a market in which to dispose of their surplus products. They began to raise pigs, cattle, sheep, and horses, but soon they had too many of these also. Some of these products of the corn belt, they loaded upon flat boats and sent down the river to New Orleans. Recall the story of Lincoln going down the Mississippi River on a flatboat. As soon as the Erie Canal was built, they began to ship their surplus corn, meat, etc., by way of the lakes, Erie Canal, and Hudson to New York. The old National road across the Alleghenies helped them, but much more the Pennsylvania, New York Central, Baltimore & Ohio, and other railroads, which were built to carry the products of the corn country to New York, Philadelphia, and Baltimore. So great were the products of the corn country that they overflowed, beyond New York and Philadelphia, were loaded upon ships for Liverpool, Hamburg, Havre, and other parts of the world.

At the present time the products of the corn belt pour in vast streams eastward over the railroads and by way of the lakes to eastern markets and to Europe.

Corn is the chief product of the corn belt but closely dependent upon it are several other large farm industries, as pork and cattle raising, the dairy

and creamery business, the canning of corn, whiskey production in the distilleries, and the great milling industries dependent largely upon corn. In the feeding of stock, as hogs, cattle, and horses, the corn is changed into other farm products of increased value, and the manures so much needed for preserving the fertility of the soils are retained on the farm.

In the silos constructed for feeding dairy cows, not only the ears of corn but the stalks and leaves are converted into a nutritious food of the best kind for producing milk and butter. In recent years many various products of corn have been found serviceable as food for the people, new dishes have been discovered, and it is claimed that corn can be used far more extensively as a nourishing food for human beings. Good corn bread can hardly be surpassed by any kind of warm bread. Hominy and grits are very extensively used in some parts of the country. Corn meal mush and corn flakes are among the best of breakfast foods. Roasting ears in season and canned corn are important food articles in the groceries. From the sale of corn or of corn-fed meats, as of dairy products, the farmers of the corn belt have grown well-to-do, and independent. They have been able from sale of the products of the corn fields to supply themselves with other foods and clothing, fruits, and drinks, as tea, coffee, and chocolate, and the hundreds of manufactured articles of many sorts which are needed by farmers' families. Even the luxuries such as fine china and glassware, tropical fruits, imported silks and laces, pictures and libraries, pianos and automobiles are now very common articles in farmers' homes. Thousands of well-to-do American families of the corn belt are able to send their children to good schools, to put them later through college and university and to train them for any of the higher professions or for a life work in any of the technical and skilled industries. In fact it is from such farmers' families that many of the best educated and most useful men and women of our country are now coming.

5. The rapid development of corn production throughout the corn-growing states has brought about a great improvement in the machines for planting, cultivating, and harvesting of this crop. Among the notable machines invented for these purposes are the following: plows, corn-planters, cultivators, steel-toothed rakes, corn-huskers, corn-shellors, corn-cutters, silos and silage cutters, machines used in canning corn, various forms of corn elevators and roller-mills and other milling machinery.

For the construction of these various machines enormous manufacturing plants have been established at Chicago and in many other cities of the western and even of the eastern states. The general improvement in agricultural machinery and methods of cultivation has been one of the greatest proofs of progress in America and of the inventiveness of our people.

6. The importance of the corn fields to our people is shown in a striking way at the State Universities. In the agricultural department of the University of Illinois experiments have been conducted by scientific experts for

the purpose of increasing the productiveness of Illinois farms. In the cultivation of corn a careful series of experiments has been carried on which has opened the eyes of Illinois farmers. It has been shown that the farmer by careful selection of seed, by proper fertilizing and treating of the soil, and by the best modes of cultivation, can produce nearly three times as much corn per acre as at present. In short our farmers might be twice as rich as they are and could more than double the number of millions of bushels they have to sell or feed. This makes it worth while to study scientifically the best methods of treating the soil and of cultivating corn.

On the University Experiment Farm are many plots of ground where various kinds of field corn are raised and different modes of cultivation tried out, where different fertilizers are tested as to results upon the crops. The selection and development of the best breeds and strains of corn have been worked out with great care. In the Farmers' Institutes all over the state the people are made acquainted with the results of these experiments and the farmers' boys are called in and trained in corn testing. The majority of older farmers go on raising corn in the old way, but in many farm neighborhoods these better, more scientific, methods of corn raising and corn feeding are gradually introduced and worked out to success.

At the University experiment stations, college professors, who have thoroughly studied plant and animal life, who are well posted in physics, chemistry, and biology, who have made a study of soils and fertilizers, are constantly at work applying their knowledge of all these subjects to the raising of corn. For the most successful cultivation of corn depends upon many kinds of scientific knowledge. The corn plant itself in its various stages of growth must be understood. What kind of soil elements are needed and what are the chemical elements in such soils? Some soils are deficient and require the addition of certain definite fertilizers, as potassium or nitrates in order to raise good corn. The soil itself requires, according to its quality different kinds of treatment, with plow and harrow, or tile drainage, or rotation of crops from year to year. Certain insects, as chinch bugs and grubs are destructive to corn crops and it is a scientific problem how to get rid of them.

All these and many other questions have to be experimentally worked out at the University. The proper raising of a corn crop has become a very interesting problem for a large group of scientific experts at the University.

This is the case at many of our state universities because the corn belt includes several great states as Illinois, Indiana, Iowa, Kansas, Minnesota, etc.

7. But the corn-producing region stretches far to the south as well as north of the so-called corn belt. In the Gulf states corn has always been a valuable crop and should become more so. In Minnesota and the Northwest, corn is rapidly becoming an important crop, taking the place largely of the wheat fields. In fact certain varieties of corn have been developed which flourish in northern latitudes. They grow more quickly and ripen more rapidly in the

short, warm northern summers where frost comes early. Corn has been raised and ripened in northwestern Canada as far north as 56° N. latitude. Thus a plant that originated in subtropical lands has gradually modified its nature so as to adapt itself to more northern climates and is now actually cultivated in fields over the greater portion of North America.

Of course, a great variety of field and garden corn has been thus developed, as the white, yellow, and other kinds of field corn, sweet corn and popcorn among garden varieties.

8. Corn was originally a product of the new world of the west and its chief centers of production are in the United States. But it is now cultivated in the temperate regions of South America where the climate and soil conditions are favorable.

In southern Europe corn is produced as an important crop in Hungary, Italy, in the valley of the Po, and other warmer parts of southern Europe. In England and Scotland, in North Germany, Scandinavia, and northern Russia corn is not produced as a crop. Corn requires a summer season of hot warm days and nights with a moderate degree of well distributed moisture. Northern Europe is too chilly for the corn. But wheat, oats, barley, and rye flourish in these cooler places.

In India also and southern Asia, the corn plant has found a home because of favorable soil and conditions of heat and moisture. Parts of southern Australia and Africa are also adapted to corn production.

9. The corn plant is well known to us as one of the few great cereals which are chief among the food plants for the support of the human race. Like all good things it can be turned to bad use. In the manufacture of whiskey in the corn states, millions of bushels of corn are used yearly. Other grains, like rye are also used for whiskey production, but corn is the grain that is chiefly employed. Our great cities like Chicago, Peoria, and St. Louis have distilleries where millions of dollars are invested in the production of whiskey. The large amount of whiskey made is shown by the millions of dollars of taxes collected by the United States government from the distilleries. It is one of the chief sources of revenue to the government, known as excise or internal revenue.

10. Corn is a somewhat new product that has come into use since the discovery of America, and more particularly in the last one hundred years.

The other grains like wheat and rice have been in common use from antiquity. Wheat and rye for bread-making have been in use for thousands of years in Europe, in Egypt and in other eastern countries and later in America. Rice, which is the chief food of the Chinese, is probably as much used for the feeding of the human race as corn, and is now produced in considerable quantity in the southern Atlantic and Gulf States.

It has been claimed that the development of the world in civilization has depended upon the successful cultivation of the great cereals.

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